

Notes.

THE Edinburgh meeting of the British Association has been successful beyond even the most sanguine anticipations. The membership has reached nearly 2800, and all the sections have been largely attended, particularly during the joint discussions. These have, indeed, been so attractive that apparently the future practical problem will be to find sufficient halls large enough to accommodate the members who wish to be present at them. It is much more easy to provide meeting-places for a number of small sections than several large halls each of which will hold 400 people or so for a joint discussion. The success of the present meeting is largely due to the untiring devotion of Prof. J. H. Ashworth, whose intimate knowledge of the work of the Association made him an ideal local secretary. Sir Edward Thorpe's temporary indisposition, which prevented him from reading his address in person, was much regretted, but we are glad to know that Sir Edward is expected to be about again in a day or two. Next year's meeting at Hull will begin on September 6, and the president will be Prof. C. S. Sherrington, president of the Royal Society. The annual meeting in 1923 will be in Liverpool, and that in 1924 will probably be held at Toronto. The new members of the council of the Association are Dr. F. W. Aston, Prof. H. J. Fleure, Sir Joseph Petavel, Prof. A. W. Porter, and Prof. A. C. Seward.

A GENERAL discussion on "Catalysis, with Special Reference to Newer Theories of Chemical Action," will be held under the auspices of the Faraday Society on Wednesday, September 28, at the Institution of Electrical Engineers, Victoria Embankment, W.C.2. The discussion will be divided into two parts. Part 1, beginning at 4.30 p.m., will deal with "The Radiation Theory of Chemical Action," and it will be opened by Prof. J. Perrin. Part 2 will be concerned with "Heterogeneous Reactions." It will be opened by Prof. I. Langmuir. Among those expected to take part in the proceedings are Prof. Arrhenius, Prof. V. Henri, Prof. E. C. C. Baly, Prof. F. G. Donnan, Prof. W. C. McC. Lewis, Prof. A. Lindemann, Prof. A. W. Porter, and Dr. E. K. Rideal. Fellows of the Chemical Society are invited to attend the meeting. Others interested in the subject may obtain tickets of admission from the secretary of the Faraday Society, 10 Essex Street, London, W.C.2.

THE annual meeting of the British Mycological Society will be held at Worcester on September 19-24. On September 21 Mr. Carleton Rea will deliver his presidential address entitled "A Brief Review." On September 22 a discussion will be opened by Dr. E. J. Butler on "The Amateur in Relation to British Mycology," and a paper read by Prof. A. H. R. Buller on "The Chemo-taxis of Slugs in Relation to Fungi." On September 23 a paper will be read by Mr. J. Ramsbottom on "The Origin of Saprophytism in Flowering Plants."

THE Ministry of Agriculture and Fisheries announces that the Official Seed Testing Station for England and Wales has been transferred from

Streatham to the National Institute of Agricultural Botany, Cambridge, and that all communications should in future be addressed to the Chief Officer, Official Seed Testing Station, Huntingdon Road, Cambridge.

IN the August issue of the *Journal of Hellenic Studies* Mr. F. N. Pryce describes a remarkable Minoan bronze statuette in the British Museum. The earliest date to which it has been traced is 1885, when it was included in the category of "unclassified or suspect bronzes," but it may possibly have entered the museum a hundred or a hundred and fifty years ago. Only quite recently its significance and value have been realised by comparison with other specimens of Minoan art. The height of the statuette, including the base on which it stands, is 8½ in. The dress, by comparison with an Egyptian representation of a Minoan envoy on the tomb of Rckhmara at Thebes, belongs clearly to that period. The remarkable feature in the statuette is that instead of the middle hair lock it seems to bear the figure of a snake, which associates it with the Minoan snake cult. The worshipper—for the figure does not represent a deity—is apparently standing in an attitude of stiff reverence before the shrine of the goddess, with whom he enters into communion by wearing her emblem.

IN the August issue of *Discovery* Miss W. S. Blackman gives an account of the mourning rites of Muslims in the province of Asyut, Egypt. Every Friday women, sometimes accompanied by their male relatives, visit this desert graveyard, wail at the graves, and distribute large basketfuls of bread. Curiously enough, Lane in his admirable account of death rites in his "Modern Egyptians" does not describe this rite, well known in other places, as in India, under the name of Ziyarat, or "visitation." It is obviously a survival of the animistic rite of feeding the dead. The rite, which has been handed down from the ancient Egyptians, is known as Prt, "coming forth" or "going up," and the reproduction which Miss Blackman publishes of an ancient Egyptian painting representing a woman wailing by the tomb of a dead relative closely resembles the photographs which she gives of the custom as it is carried out in modern Egypt.

DURING excavations made at Middleton-on-the-Wolds recently in connection with a whiting works there, a square grave cut into the chalk, which measured 3 ft. each way, was found, and adjoining it a long V-shaped trench. The owner, Mr. E. B. Lotherington, communicated with Mr. T. Sheppard, of the Hull Museum, and the trench was carefully excavated. The grave contained a human skeleton in a crouched position, on one arm of which was an iron bracelet carrying two large bone beads. In the same grave was a massive bone ring made from the thick part of an antler of a red deer. This measures 2¼ in. across and is remarkably well made, resembling the familiar ivory rings from Africa. Pottery found

in association with the burial consists of typical greyware turned on a wheel, and the rough hand-made dark pottery made from the Kimeridge clay, containing white fragments of grit, etc. The trench yielded numerous pieces of pottery, a part of a red deer antler pick which had been cut by a metal instrument, and bones of horse, ox, pig, sheep, and dog. The remains point to the hill upon which they were found having been occupied by the Romans in the second or third century. The trench excavated was only one of a number visible. The objects excavated have been placed in the museum at Hull.

WITH reference to the Note in NATURE (August 18) describing a catalogue of specimens of tapa or bark-cloth recently acquired by the Pennsylvania University Museum, Mr. Chas. J. A. Howes writes from 36 Havelock Road, Earlham Road, Norwich, that he possesses a copy of this rare work, but the title-page seems to differ in some particulars from that of the Pennsylvania copy. In Mr. Howes's copy specimen No. 18 is described as "the very finest of the inner coat of the mulberry wore (*sic*) by the chiefs of Otaheite." The collector notes, regarding this specimen, that some seamen were sent to fetch fresh provisions, and one of them met some children at play. One of them, a girl, snatched at the red feathers which he had stuck in his cap. He at once took them out and presented them to her. In the evening she came to the shore, and, singling him out from his companions, gave him the piece of cloth from which this specimen was cut—"a true sign of gratitude in these people."

IN a short article contributed to the *Memoirs of the Manchester Literary and Philosophical Society* (vol. 64, part 2) Major Leonard Munn discusses the ancient mines and megaliths in the Hyderabad State. The writer attempts to cover too much ground in a short paper, but he gives some interesting information. In corroboration of Prof. Elliot Smith's theories, he finds the stone monuments closely connected with ancient gold-mines, but of many of these the sites are now forgotten. Enough remains to show the perseverance and intelligence of the early miners. "Unless anyone has visited Hyderabad State, or, in fact, Southern India, they cannot form any idea of the abundance, the extent, or the pureness of its iron-ores. No section of the geological sequence exists in which iron does not occur."

THE Gold Coast Survey Department, which appears to have been suspended during the war, was reopened in the latter part of 1919. The annual report for 1920 by the Surveyor-General, Lt.-Col. R. H. Rowe, has now been published, and shows much progress in the Department. The principal work was the completion of the topographical survey of the Colony, of which several sheets have already been produced on a scale of 1:125,000. During the year an area of 1200 square miles was surveyed. It is hoped shortly to undertake the reproduction of the sheets in the Colony, and buildings are being erected for this purpose. A school for the instruction of native surveyors was to be opened this year.

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THE Geological Survey has just issued vol. 17 of the Special Reports on the Mineral Resources of Great Britain, the present volume being issued under the auspices of the Scottish Branch of the Survey. In this volume an account is given of the occurrence of the ores of lead, zinc, copper, and nickel in Scotland, the bulk of the work having been done by Mr. G. V. Wilson, whilst Dr. J. S. Flett, now Director of the Survey, has written the chapters on Caithness and on the Orkney and Shetland Islands. The work is exceedingly well done, and shows much painstaking study and research. It brings out, however, only too clearly the unfortunate fact that from the economic point of view the occurrences of these ores in Scotland are practically negligible. The only ore which occurs in any noteworthy quantity is that of lead, and this is due to one single mining district, for as such Wanlockhead and Leadhills may fairly be regarded, though the former lies in Dumfriesshire and the latter in the adjoining portion of Lanarkshire. During the period 1850-1920 the total production of lead from Scottish mines was 180,271 tons, of which the mining area above-mentioned contributed no fewer than 172,000 tons, the production from each group of mines being about equal. Similarly, the largest annual output of lead from Wanlockhead is given as 2578 tons and from Leadhills as 2600 tons, whilst no other mine in Scotland has reached an annual output of 400 tons. The present report is, therefore, more interesting from the geological than from the economic aspect, and Mr. Wilson has devoted much attention to the mode of origin of the deposits and to the vein-fillings. A considerable number of the minerals present are secondary in nature, and reasons are given for considering that the reactions causing secondary solution and deposition of certain of the ores are probably still in operation. It is to be regretted that the scope of this report was not somewhat widened so as to include all metalliferous minerals (with the exception of the ores of iron, which have already been fully discussed). This could have been done without adding much either to the labour involved or to the bulk of the report, and it would have been convenient to have had the occurrences of gold, for example, properly classified and fully described instead of finding merely casual references to its occurrence.

THE *Weekly Weather Report* of the Meteorological Office for the week ending August 27 gives a summary of temperature, rainfall, and sunshine for the summer season obtained from the values for the thirteen weeks from May 29 to August 27 for the several districts in the British Isles. The highest mean temperature for the summer in any district was 62.1° F. at the English Channel stations, and the second highest was 61.5° for South-East England. The mean temperature was above the normal in all districts with the exception of North and East Scotland, the greatest excess being 2.3° F. in the Midland Counties. The rainfall was decidedly less than normal except in West Scotland. The least total rainfall for the summer season was 2.04 in. for South-East England, which is 3.98 in. less than the thirty-

five-year normal and only 34 per cent. of the average. The next smallest total was 2.20 in. for East England, which is 4.06 in. less than the normal and 35 per cent. of the average. At the English Channel stations the total was 3.83 in., which is 2.52 in. less than the normal and 60 per cent. of the average. Bright sunshine was in excess of normal in all districts except North Scotland, the greatest amount of the possible duration being 53 per cent. at the English Channel stations, followed by 47 per cent. in South-East England and 46 per cent. in South-West England. The Greenwich values for the civil day published in the weekly returns of the Registrar-General give the average temperature, mean of maximum and minimum, 64.2° F. for the three summer months combined, the respective means being June 60.3° F., July 68.5° F., and August 63.8° F. The excess on the average for thirty-five years for the whole summer is 2.2° F., for June 0.4° F., for July 5.0° F., and for August 1.2° F. The rainfall for the three summer months combined was 1.29 in., the total for June being 0.46 in., that of July 0.15 in., and that of August 0.68 in. The deficiency for the summer on the average for 100 years is 5.42 in., and the total is only 19 per cent. of the average. Smaller falls have occurred previously in each month, but only once in July, in 1825, when 0.10 in. fell. The fall for the whole summer is the smallest in the last 105 years, the next lowest being 1.36 in. during the summer of 1818, followed by 2.50 in. for 1864. The sunshine for the three summer months at Greenwich registered 222 hours in June, 286 hours in July, and 179 hours in August, in all 687 hours, which is 92 hours in excess of the normal for the summer season.

CHARTS showing the deviation of the pressure and temperature from normal values for each month and for the year 1910, based on observations at land stations—generally two for each 10° square of latitude and longitude—have just been published by the Meteorological Office under the title of "Réseau Mondial, 1910." The charts have been prepared to illustrate the tables which were issued in 1920, and a similar volume of charts for 1911 was published in 1916. The late war has rendered it difficult at present to obtain data for the later years. This world-wide meteorology will add much to our present knowledge of weather changes, which in many respects are exceedingly intricate; it is by such world-wide information that we may eventually hope to forecast for longer periods than is possible at present, and in time, perhaps, we may foresee the character of a coming season. Atmospheric-pressure lines of equal deviation from normal are given for each five millibars, and for temperature the individual deviations are plotted for each station. In this volume it has not been found possible to represent graphically the deviation of rainfall from normal. Among many other questions of interest, such charts may render it possible to form some idea as to whether the pressure of the atmosphere is always practically uniform over the world as a whole; the charts in question would seem to suggest that it is, but a more detailed

examination must be made to substantiate such a conclusion.

THE September issue of the *Philosophical Magazine* contains a paper on "The Effect of Temperature on the Rigidity and Viscosity of Metals" by Messrs. Kei Iokibe and Sukeaki Sakai, of the University of Sendai, Japan, which appeared in vol. 16 of the Science Reports of that University. The method used by the authors is that of torsional oscillations of a wire 25 cm. long and 0.6 to 0.7 mm. diameter suspended vertically in a tube furnace electrically heated to 700° – 800° C. In all the thirteen metals tested as the temperature rises the rigidity decreases, according to a parabolic law which would make the value zero at the melting point. The decrease at low temperatures is small for metals with high melting points, but becomes rapid near the melting points in all cases. The viscosity as determined on Honda's theory from the logarithmic decrement of the oscillation increases rapidly as the temperature rises up to the melting point, but in the case of metals with high melting points there is a range of temperature below 100° C. within which the viscosity decreases slightly with rise of temperature.

IN a note on p. 502 of NATURE for June 16 we directed attention to the conclusion of Mr. T. L. Eckersley that the main source of the trouble in the determination of the direction from which a radio message comes during the night is the wave reflected downwards at the under-surface of an outer conducting layer of the atmosphere. In the August issue of the *Radio Review* Messrs. G. M. Wright and S. B. Smith, of the Marconi Research Department, describe observations on the night behaviour of the heart-shaped polar diagram obtained by combining a single frame with a vertical aerial, and find that it agrees with the reflected-wave theory. It shows further that the reflected ray is in a vertical plane and that its angle of incidence is small. In these circumstances the minimum of the heart-shaped diagram gives the correct bearing of the transmitting station, whether night disturbances are present or not.

THE paper on the magnetic electron which Prof. A. H. Compton, of the University of St. Louis, contributed to the American Association for the Advancement of Science in December last is reproduced in the August issue of the *Journal of the Franklin Institute*. After pointing out that Langevin's theory of diamagnetism is inadequate quantitatively and makes diamagnetism transient instead of permanent, Prof. Compton shows that the evidence is in favour of the negative electric charge being the prime cause of the magnetic property of the molecule. His own observations on the passage of X-rays through, and their reflection from, magnetised crystals show no evidence of the orientation of the molecules by the magnetic field, which present theories of magnetisation postulate. He considers that the electron spinning about an axis through itself like a small gyrostat is more likely to be the ultimate magnetic particle than either the atom or the molecule, and thinks that the spiral form of path which is so

frequent in the case of cathode or β -rays in air supports his view.

A FURTHER contribution to the study of the African rift valleys and their world-relations will be issued shortly by Messrs. Seeley Service and Co., Ltd., in a new work by Prof. J. W. Gregory, entitled "The Geology and Rift Valleys of East Africa." Its object is to show the continuity of the rift valley from Palestine to south of the Zambesi, with the exception of a short gap in the southern part of the Tanganyika territory. The work also summarises the volcanic history of East Africa, and shows that the rift valleys have been formed by a series of earth movements connected with the foundering of the Indian Ocean. These movements began in the Cretaceous, and have lasted until quite recent times. Some movements in connection with them are probably still in progress.

THE new list of forthcoming books just issued by Messrs. Methuen and Co., Ltd., contains a number of works relating to the subject of relativity, viz.:—"Space—Time—Matter," Prof. H. Weyl, translated by H. L. Brose; "Einstein the Searcher: His Work Explained from Dialogues with Einstein," A. Moszkowski, translated by H. L. Brose; "An Introduction to the Theory of Relativity," L. Bolton; "Relativity and the Universe," Dr. H. Schmidt, translated by Dr. K. Wichmann; "The Ideas of Einstein's Theory," Prof. J. H. Thirring; "Relativity and Gravitation," by various writers, edited by J. M. Bird; and "The Fourth Dimension Simply Explained," a collection of essays selected from those submitted in the *Scientific American's* prize contest, with an introduction and editorial notes by Prof. H. P. Manning.

Our Astronomical Column.

THE BRIGHT OBJECT OF AUGUST 7.—*Astr. Nach.* No. 5118 contains a further observation of this object made at Plauen, Vogtland, by the daughter of Prof. E. Kaiser and several others. It appeared like Venus at its greatest brilliancy, low in the evening sky shortly after sunset. Its position with regard to distant terrestrial objects was accurately noted. At G.M.T. 7h. 35m. its azimuth was $98^{\circ} 22' 6''$ from south to west, and its apparent altitude $2^{\circ} 35' 9''$, or $2^{\circ} 21' 9''$ corrected for refraction. Plauen is in N. lat. $50^{\circ} 29' 45''$, long. E. Greenwich $12^{\circ} 7' 11''$; Prof. M. Wolf deduces that the R.A. of the body was 11h. 6.7m., N. decl. $7^{\circ} 9'$. This gives longitude $165^{\circ} 0'$, N. lat. $1^{\circ} 20'$. It may be mentioned that the place of Jupiter was R.A. 11h. 23.9 m., N. decl. $5^{\circ} 6'$, but it does not seem possible that this could have been the body observed.

The Lick Observatory position at G.M.T. 15h. was about R.A. 9h. 22m., N. decl. $15^{\circ} 8'$, or longitude 138° , N. lat. $0^{\circ} 4'$.

It is to be noted that the object observed in England was much closer to the sun (estimates of distance 6° and 4° respectively) than the Plauen object, so that an element of doubt remains. But the latter observation was made in a much more exact manner, so it deserves greater weight. If we assume the identity of the Plauen and Lick objects, and that the motion was parabolic, then the maximum distance from the earth on August 7 was 0.005 in astronomical units, or about twice the moon's distance. It appears unlikely that a comet at this small distance would have such a well-defined stellar appearance.

EINSTEIN'S REAL ACHIEVEMENT.—The *Fortnightly Review* for September contains an article with the above title by Sir Oliver Lodge, in which he alludes to the awakening of interest in relativity brought about by Einstein's visit to England and the publication of Lord Haldane's book, which extends the doctrine to a wider field than that of kinematics.

Sir Oliver Lodge notes that the more ardent relativists treat the subject from a purely geometrical point of view, and endeavour to eliminate all reference to physical laws. For example, they suggest that the speed of a falling apple may be equally well attributed to the earth, and that the diurnal rotational movement may be ascribed to the heavenly bodies themselves. They minimise their references to the æther, some of them denying its existence. He deprecates these methods of treatment as unlikely to lead to advance in our knowledge of the universe. For his own part he expresses an ardent belief in the reality of the æther and its association with electricity

and matter. He gives a brief *résumé* of the work of Clerk Maxwell (extended by Larmor, Lorentz, and Thomson), referring in particular to the relation connecting the electrostatic and electromagnetic units with the velocity of light, and passing on to the Lorentz-FitzGerald contraction, which plays an important part in the equations of relativity.

He urges the retention of the Newtonian conception of force in celestial mechanics, the simple law of inverse squares being amplified by the addition of the terms arising from the change of inertia with motion. He expresses his admiration at the skill which has succeeded in reducing the action of forces to formulæ in pure geometry; nevertheless, he considers that one is thereby introducing complexity and departing from the realities of Nature. However, throughout the article there is nothing but praise for Einstein's achievements, and criticism is merely directed against the method of expressing them.

NEBULAR LINES IN SPECTRUM OF R AQUARI.—The detection of the bright nebular lines at 4363, 4471 (helium), 4658, 4959, and 5007 superposed on the Md spectrum of this star was announced in 1919 by Mr. Paul Merrill, who gives an account in the *Astrophys. Journ.* for June of his further researches on the spectrum. Four spectra are reproduced, three of which were taken about a month before maximum (magnitude 8.3 to 7.0), and the fourth forty-seven days after minimum (magnitude 10.2). The first three show a continuous spectrum with the customary lines and bands of the Md type, together with the five bright lines. The fourth shows the bright lines quite as strongly as at maximum, but there is no trace in the reproduction of a continuous spectrum, and it is noted that it was practically absent even with considerably longer exposures.

There is also a comparison of the displacements of the two spectra on the plates taken near maximum. The Md bright lines give -33 km./sec., Md absorption lines -19 , nebular lines except 4363 -10 , and 4363 nebular -25 . A statistical investigation on the stars of Md spectrum is being undertaken in the hope of determining whether the bright lines or the absorption ones, or neither, give the correct radial velocity. Many of them, including Mira Ceti, give the same relative displacement of about 14 km./sec.

Mr. Merrill suspects that the appearance of the nebular lines in the spectrum of R Aquarii may have taken place quite recently. He has examined the Harvard objective-prism spectrograms (dating from 1893). These lines are not observable on them.